

REMARKS

In the OFFICE ACTION dated June 02, 2005, claim 24 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite due to a lack of antecedent basis for the term “the fabric layer of said self-adhesive prepreg”. Applicant amends claim 24 as suggested by the Examiner to overcome this rejection.

As set forth in paragraphs 4-9 of the Office Action, all of the claims continue to be rejected under 35 U.S.C. 103 (a) as being unpatentable over Kishi et al. in view of Recker et al. when taken alone and/or in combination with a number of secondary references.

Applicant amends claims 1 and 17 to more particularly point out applicants invention and distinguish it from the references of record. Specifically, the claims are amended to point out that applicant’s self-adhesive prepreg includes: 1) a thermoplastic viscosity control agent that is dissolved in the prepreg resin to control viscosity of the prepreg prior to curing; and 2) thermoplastic fillet forming particles that dissolve as the prepreg resin cures in order to control formation of fillets as the prepreg bonds to the honeycomb.

Kishi et al. does not teach or suggest the claimed self-adhesive prepreg where two different thermoplastics materials are used to provide two different functions. First, a soluble thermoplastic is used to control viscosity of the resin during formation and handling of the prepreg. This is important to insure that the prepreg resin can be impregnated into the fiber layer and that the resulting prepreg can be handled and has suitable properties, such as tack and drapability. Second, the prepreg contains thermoplastic particles, which dissolve only during the curing/bonding step to promote fillet formation and provide the additional advantage of toughening of the resin that bonds the prepreg to the honeycomb (see paragraph 24 of applicant’s specification).

Kishi et al. does teach the use of a wide variety of materials to control the viscosity of the prepreg resin during formation of the prepreg. However, there is no teaching to initially control viscosity with a dissolved thermoplastic viscosity control agent and then control fillet formation using thermoplastic particles that dissolve during

the curing/bonding process. The only teaching regarding particles in Kishi et al. is the use of silica and other insoluble particles that remain as particles throughout the curing process. This is completely different from applicant's use of thermoplastic particles that dissolve during the curing process for the specific purpose of promoting fillet formation and enhancing fillet toughness during the cure.

The Examiner is incorrect in comparing Kishi et al.'s minimum viscosity of 30 to 400 poise to applicant's claimed minimum viscosity of 150 to 1500. Kishi et al.'s minimum viscosity is measured only as the resin temperature is increased from 50°C to 80°C (Page 5, lines 14 to 17). Kishi et al. says nothing about the viscosity of the resin as it is heated to the much higher curing temperature of about 180°C (see Kishi et al. examples). In contrast, Applicant's minimum resin viscosity is specifically measured at temperatures up to and including the curing temperature. This is an important distinction because it shows that Kishi et al. was only concerned with the viscosity of the prepreg resin at temperatures well below curing. Kishi et al. was not concerned about what happened to the resin viscosity during heating to curing temperature.

Applicant's invention, on the other hand, is directly concerned with cure temperature viscosities and fillet formation during the cure. Applicant provides control of the viscosity of the resin during curing by including thermoplastic particles that dissolve only during the curing process. As discovered by applicant, "The viscosity of the resin mixture gradually increases when the fillet forming particles dissolve during the curing process." (See Paragraph 22 of the specification). There is nothing in Kishi et al. which discusses the dynamics of resin viscosity during the curing cycle when a complex interaction of heat induced polymerization and rheology changes occur in the resin. Accordingly, there is no teaching or suggestion to use thermoplastic particles to provide a gradual viscosity change during the curing process to enhance fillet formation with the added benefit of toughening the fillet resin.

Recker et al. does not provide any motivation for one of ordinary skill to use differentially soluble thermoplastics to control viscosity during curing to enhance fillet formation during bonding of a self adhesive prepreg to honeycomb. Recker et al. is

completely silent with respect to viscosity of the resin during heating to curing temperatures. Recker et al. provides no information on what happens to the resin viscosity as the resins are heated during cure and whether or not such resins would be suitable for use in a self adhesive prepreg where fillet formation is an important consideration. Instead, Recker et al. is directed to toughening of resins, which are used as structural adhesives or as prepreg resins for prepregs used in making composite bodies. Recker et al. focuses on the compression after impact (CAI) of the thermoplastic toughened resins and says nothing about viscosity.

Applicant disagrees with the Examiner's position that Recker et al. is combinable with Kishi et al. because these references are in the same field of endeavor. Kishi et al. is specifically limited to self adhesive prepregs which have very specific requirements with respect to: 1) prepreg formation and handling properties of the prepreg prior to bonding to honeycomb; and 2) formation of bonds to the honeycomb edges via fillet formation. Recker et al. is in no way concerned with the unique requirements of self adhesive prepregs for bonding to honeycomb. Rather, Recker et al. is directed to the entirely different art area of toughening resins used in structural adhesive films and prepregs used in forming composite bodies. These two references may both be in the general field of composites, but they are directed to significantly different endeavors within this general field.

Both Kishi et al. and Recker et al. are silent with regards to the viscosity of their resins and fillet formation at cure temperatures. Accordingly, there is no motivation to combine them in an attempt to reach applicant's invention. One of ordinary skill would only be motivated to combine the teachings of Recker et al. with Kishi et al. if he/she was aware of applicant's discovery that the dissolution of thermoplastic particles during the curing process provides a beneficial effect (rather than a detrimental effect) on the fillets that are formed. However, this involves the impermissible use of hindsight. Applicant's invention provides an unexpected result, because neither Kishi et al. nor Recker et al. provide a basis to have any expectation with respect to what might happen to the fillets if

thermoplastic particles are dissolved during the curing and bonding of a self adhesive prepreg to the edge of a honeycomb.

In view of the above remarks, applicant respectfully requests that the rejection set forth in paragraph 4 of the Office Action be reexamined and withdrawn.

In paragraphs 5 – 9 of the Office Action, a number of different claims have been rejected based on Kishi et al. and Recker et al., when taken in view of additional references, such as Hayes, Ghali et al., Portelli et al., Maranci et al. and Japan '619. All of these additional references must be combined with Kishi et al. and Recker et al. in order to support the rejections. Applicant submits that these rejections should also be withdrawn, since they depend on Kishi et al. and Recker et al. as the basis for obviousness.

In view of the above amendments and remarks, applicants respectfully request that this application be reexamined and allowed.

Please charge any fees or credit any overpayments to Deposit Account No. 082060.

Respectfully submitted,

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